

IN THE CLAIMS:

1-~~[[27]]~~ 26. (Cancelled)

~~[[28]]~~ 27. (Currently Amended) A system for analyzing elements in a sample comprising:

a combustion member comprising one of a high-frequency heating furnace and an electric resistance furnace for receiving the sample;

a source of oxygen gas connected to the combustion member to supply oxygen gas to the combustion member as the sample is heated to gasify the elements in the sample;

a sample section ~~means~~ connected to the ~~heating~~ combustion member by an exhaust conduit for sampling at a constant interval and at constant amounts;

a dust filter unit operatively connected to the exhaust conduit for removing dust;

an oxidizing device operatively connected to the exhaust conduit for oxidizing

~~[[the]]~~ a gas output of the combustion member;

a dehumidifier for dehumidifying the gas output before the gasified elements are analyzed;

a mass spectrometer; ~~[[and]]~~

a conduit connecting the sampling section to the mass spectrometer whereby the gasified elements are analyzed quantitatively by the mass spectrometer to determine at least an element of C, S, and N to an accuracy of 0.1 ppm; and

a feedback circulating system for recirculating the gasified elements to the combustion member until all of the elements in the sample are adequately gasified.

~~[[29]]~~ 28. (Cancelled)

1 [[30]] 29. (Currently Amended) A system for analyzing elements in a steel

2 specimen, comprising:

3 a combustion member for receiving the steel specimen;

4 a source of oxygen gas connected to the combustion member to supply oxygen
5 gas to the combustion member as the sample specimen is heated to gasify the elements in the
6 sample;

7 an exhaust channel from the combustion member for removing the gasified
8 elements;

9 a dust filter unit, operatively connected to the exhaust channel, for removing any
10 oxidized dust;

11 a dehumidifier unit, operatively connected to the exhaust channel, for removing
12 water vapor;

13 an oxidizing device, operatively connected to the exhaust channel, for oxidizing
14 any CO contained in the gasified elements;

15 a sampling section—means, connected to the exhaust channel, for sampling at a
16 constant interval and at constant amounts of gasified elements; [[and]]

17 a mass spectrometer connected to the sampling section whereby the gasified
18 elements are analyzed quantitatively to determine the elements in the steel specimen; and

19 a feedback circulating system connected to the combustion member and
20 connected downstream of the dust filter unit and upstream of the mass spectrometer to provide a
21 recirculation of a combustion gas containing the elements through the combustion member
22 before analysis by the mass spectrometer.

1 [[31]] 30. (Currently Amended) The system of Claim [[30]] 29 wherein the mass
2 spectrometer analyzes the gasified elements to an accuracy of 0.1 ppm.

1 [[32]] 31. (Currently Amended) The system of Claim [[30]] 29 further including
2 means for providing an electric field to ionize the gasified elements prior to an introduction into
3 the mass spectrometer including a heatable filament, an electron collecting electrode, an ion
4 producing electrode, and an ion extracting electrode.

1 [[33]] 32. (Cancelled)

1 [[34]] 33. (Currently Amended) The system of Claim [[33]] 29 further including a
2 suction pump operatively connected in the feedback circulating system to feed back the gasified
3 elements until the steel ~~sample~~ specimen is completely combusted.

1 [[35]] 34. (Currently Amended) The system of Claim [[34]] 29 further including a
2 valve member for selectively connecting the exhaust channel to either the feedback circulating
3 system or the mass spectrometer.

1 [[36]] 35. (Currently Amended) The system of Claim [[35]] 29 wherein the
2 combustion member is selected from one of a high-frequency heating furnace and an electric
3 resistance furnace.